

≡ HYDROLOGY AND RAINFALL APPARATUS

H313

A self-contained, floor-standing unit consisting of a water reservoir and a tank for sand with overhead spray nozzles that simulate rainfall, both stationary and moving. It is for studying hydrology principles, including rainfall, throughflow and the movement of water over land and rivers.



KEY FEATURES

- Permeable catchment area fed with 'rain' from overhead spray nozzles and/or by groundwater flow from ends of tank
- Spray nozzles to supply half or all of catchment area
- Piezometer tappings to measure water table profile
- Can measure 'drawdown' due to single or two interacting wells
- Adjustable inclination of catchment area angle
- Includes flow meter to measure flow to the catchment area
- Run-off and well flows measured by calibrated rectangular weir
- Self-contained, requires only an electrical supply

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DESCRIPTION

The apparatus is a sturdy metal frame which holds a large rectangular stainless steel tank (catchment area) and a reservoir tank. Students can fill the catchment area with a granular medium (not included) to form a permeable catchment area.

A jacking mechanism allows adjustment of the angle of the catchment area. Above the catchment area is a frame that holds spray nozzles which simulate rainfall on the catchment. A valve selects all or half the nozzles. Students can use this facility to vary the lag time on a hydrograph or to simulate a moving storm.

At each end of the catchment area are end compartments, separated from the catchment by weir plates with porous 'port holes'. Students can open the port holes to drain water from the catchment area, or to supply water to it from the end compartments.

In the middle of the catchment area are two 'wells' for experiments with water wells. A row of 20 tapplings along the centre line of the catchment area allows students to measure the water table profile. Each tapping has special slotted ends to stop the permeable media entering its pipe. The tapplings connect to a bank of piezometer tubes at the front of the catchment area.

A pump takes water from the reservoir and feeds it to the overhead nozzles and to the ends of the catchment area. Students can vary the flow to the nozzles and tank. A flow meter measures the overall flow.

Students can use a calibrated rectangular weir under the catchment area to measure flow from the wells or the tank.

The apparatus is completely self-contained and needs only a mains electrical supply. The permeable medium is not included with the apparatus, but TecQuipment offers a suitable grade of sand as an essential ancillary.

STANDARD FEATURES

- Supplied with a comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

RECOMMENDED ANCILLARY

- 800kg Permeable Medium (H313a) – Washed, graded sand, 0.5 mm to 1.5 mm

ESSENTIAL SERVICES

ELECTRICAL SUPPLY (SPECIFIED ON ORDER):

Single-phase 220 – 230 VAC, 50 Hz, 3A

or 110 – 120 VAC, 60 Hz, 6A

FLOOR SPACE NEEDED:

Approximately 3 m x 2 m

LEARNING OUTCOMES

- Investigation of rainfall/run-off relationships for dry, saturated and impermeable catchments of various slopes (surface run-off only)
- Effect of interflow on outflow hydrograph surface run-off (plus groundwater flow)
- Simulation of multiple and moving storms
- Measurement of cone of depression for a single well and comparison with theory interaction of cones of depression for two adjacent wells
- De-watering of excavation sites by use of wells
- Flow from a well in a confined aquifer
- Demonstration of watersheds for a simulated island with rainfall and well flows
- Sediment transport and meanders in simulated rivers
- Studies of scour around simulated bridge piers
- Demonstration of erosion caused by water through flow

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

–25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

SPECIFICATIONS

NETT DIMENSIONS AND WEIGHTS:

2400 x 1080 x 2050 mm and 450 kg

PACKED DIMENSIONS AND WEIGHTS:

5.77 m³ and 600 kg (approx – packed for export)

MAIN PARTS:

- Catchment area: Stainless steel tank 2 m x 1 m
Normal depth of permeable medium 180 mm
- Spray nozzles: Eight, in two banks of four, with adjustable spray direction
- Reservoir tank: Capacity approx 220 litres
- Recommended medium: Approx 800kg of washed sand graded 0.5 mm to 1.5 mm